

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 2, 2015 / 2016

### THI2211– HUMAN COMPUTER INTERACTION

(All Sections / Groups)

5<sup>th</sup> MARCH 2016  
9.00am-11.00am  
( 2 Hours )

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#### INSTRUCTIONS TO STUDENTS

1. This question paper consists of 10 printed pages.
2. Attempt **ALL** questions in **SECTION A**, **ALL** questions in **SECTION B** and **ONLY ONE** in **SECTION C**.  
The distribution of the marks for each question is given.
3. Please write all your answers clearly in the answer booklet provided.

**SECTION A: (Total=20 marks)****Designing For the Elderly: Ways Older People Use Digital Technology Differently**

*By Ollie Campbell, February 5th, 2015*

If you work in the tech industry, it's easy to forget that older people exist. Most tech workers are really young, so it's easy to see why most technology is designed for young people. But consider this: By 2030, around 19% of people in the US will be over 65. Doesn't sound like a lot? Well, it happens to be about the same number of people in the US who own an iPhone today. Which of these two groups do you think Silicon Valley spends more time thinking about?

While the ageing process is different for everyone, we all go through some fundamental changes. Not all of them are what you'd expect. For example, despite declining health, older people tend to be significantly happier and better at appreciating what they have. But ageing makes some things harder as well, and one of those things is using technology. If you're designing technology for older people, below are seven key things you need to know.

(How old is old? It depends. While I've deliberately avoided trying to define such an amorphous group using chronological boundaries, it's safe to assume that each of the following issues becomes increasingly significant after 65 years of age.)

**Vision and Hearing**

From the age of about 40, the lens of the eye begins to harden, causing a condition called "presbyopia." This is a normal part of ageing that makes it increasingly difficult to read text that is small and close.

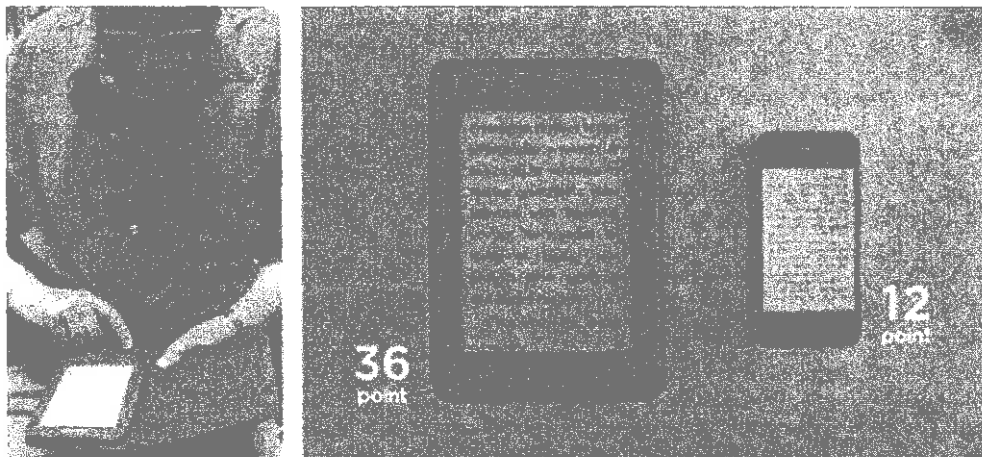


Figure: Here's a 75-year-old with his Kindle. Take a look at the font size he picks when he's in control. Now compare it to the average font size on an iPhone. (Image: Navy Design.)

Color vision also declines with age, and we become worse at distinguishing between similar colors. In particular, shades of blue appear to be faded or desaturated.

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Hearing also declines in predictable ways, and a large proportion of people over 65 have some form of hearing loss. While audio is seldom fundamental to interaction with a product, there are obvious implications for certain types of content.

## **Motor Control**

Our motor skills decline with age, which makes it harder to use computers in various ways. For example, during some user testing at a retirement village, we saw an 80-year-old who always uses the mouse with two hands. Like many older people, she had a lot of trouble hitting interface targets and moving from one thing to the next.

In the general population, a mouse is more accurate than a finger. But in our user testing, we've seen older people perform better using touch interfaces. This is consistent with research that shows that finger tapping declines later than some other motor skills.

## **Device Use**

If you want to predict the future, just look at what middle-class American teens are doing. Right now, they're using their mobile phones for everything.

– Dustin Curtis

It's safe to assume Dustin has never watched a 75-year-old use a mobile phone. Eventually, changes in vision and motor control make small screens impractical for everyone. Smartphones are a young person's tool, and not even the coolest teenager can escape their biological destiny.

In our research, older people consistently described phones as “annoying” and “fiddly.” Those who own them seldom use them, often not touching them for days at a time. They often ignore SMS' entirely.

But older people aren't afraid to try new technology when they see a clear benefit. For example, older people are the largest users of tablets. This makes sense when you consider the defining difference between a tablet and a phone: screen size. The recent slump in tablet sales also makes sense if you accept that older people have longer upgrade cycles than younger people.

## **Relationships**

Older people have different relationships than young people, at least partly because they've had more time to cultivate them. For example, we conducted some research into how older people interact with health care professionals. In many cases, they've seen the same doctors for decades, leading to a very high degree of trust.

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I regard it like going to see old pals.... I feel I could tell my general practitioner (GP) almost anything. George, 73, on visiting his medical team due to health and mobility issues, the world available to the elderly is often smaller, both physically and socially. Digital technology has an obvious role to play here, by connecting people virtually when being in the same room is hard.

### **Experience with Technology**

I once sat with a man in his 80s as he used a library interface. "I know there are things down there that I want to read" he said, gesturing to the bottom of the screen, "but I can't figure out how to get to them." After I taught him how to use a scrollbar, his experience changed completely. In another session, two of the older participants told me that they'd never used a search field before.

Generally when you're designing interfaces, you're working within a certain kind of scaffolding. And it's easy to assume that everyone knows how that scaffolding works. But people who didn't grow up with computers might have never used the interface elements we take for granted. Is a scrollbar a good design for moving content up and down? Is its function self-evident? These aren't questions most designers often ask. But the success of your design might depend on a thousand parts of the interface that you can't control and probably aren't even aware of.

### **Cognition**

The science of cognition is a huge topic, and ageing changes how we think in unpredictable ways. Some people are razor-sharp in their 80s, while others decline as early as in their 60s.

Despite this variability, three areas are particularly relevant to designing for the elderly: memory, attention and decision-making.

### **MEMORY**

There are different kinds of memory, and they're affected differently by the ageing process. For example, procedural memory (that is, remembering how to do things) is generally unaffected. People of all ages are able to learn new skills and reproduce them over time.

But other types of memory suffer as we age. Short-term memory and episodic memory are particularly vulnerable. And, although the causes are unclear, older people often have difficulty manipulating the contents of their working memory. This means that they may have trouble understanding how to combine complex new concepts in a product or interface.

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Prospective memory (remembering to do something in the future) also suffers. This is particularly relevant for habitual tasks, like remembering to take medication at the right time every day.

How do people manage this decline? In our research, we've found that paper is king. Older people almost exclusively use calendars and diaries to supplement their memory. But well-designed technology has great potential to provide cues for these important actions.

## ATTENTION

It's easy to view ageing as a decline, but it's not all bad news. In our research, we've observed one big advantage: Elderly people consistently excel in attention span, persistence and thoroughness. Jakob Nielsen has observed similar things, finding that 95% of seniors are "methodical" in their behaviors. This is significant in a world where the average person's attention span has actually dropped below the level of a goldfish. It can be a great feeling to watch an older user really take the time to explore your design during a testing session. And it means that older people often find things that younger people skip right over. I often find myself admiring this way of interacting with the world. But the obvious downside of a slower pace is increased time to complete tasks.

Older people are also less adept at dividing their attention between multiple tasks. In a world obsessed with multitasking, this can seem like a handicap. But because multitasking is probably a bad idea in the first place, designing products that help people to focus on one thing at a time can have benefits for all age groups.

## DECISION-MAKING

Young people tend to weigh a lot of options before settling on one. Older people make decisions a bit differently. They tend to emphasize prior knowledge (perhaps because they've had more time to accumulate it). And they give more weight to the opinions of experts (for example, their doctor for medical decisions).

The exact reason for this is unclear, but it may be due to other cognitive limitations that make comparing new options more difficult.

## Conclusion

A lot of people in the tech industry talk about "changing the world" and "making people's lives better." But bad design is excluding whole sections of the population from the benefits of technology. If you're a designer, you can help change that. By following some simple principles, you can create more inclusive products that work better for everyone, especially the people who need them the most.

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**Question:**

- (a) “The design and development of digital technology for older people must be made according to user’s cognitive abilities”. As a Human Computer Interaction designer, why do you think we need to understand elder user? Please elaborate your answer based on the case study.

[6 marks]

- (b) As a Human Computer Interaction (HCI) specialist, after reading the case study, discuss in details the three areas that are particularly relevant to designing for the elderly, which can then lead to the design of better interactive products for the elderly.

[6 marks]

- (c) As a Human Computer Interaction Specialist, you are required to investigate the case study and elaborate the THREE (3) most important success factors for the elderly technology interaction.

[6 marks]

- (d) Briefly explain the concept of “Affordances” in terms of technology for the elderly.

[2 marks]

**Continued...**

**SECTION B: ANSWER ALL QUESTIONS (Total=20 marks)****QUESTION 1:**

- a) Figure 1 and Figure 2 below show two different types of interface styles. Identify the type and give one characteristic for each interface style. From your own opinion, which interface style is easier for a novice user and why?

```
sable.soc.staffs.edu.my> javac Hello
javac: invalid argument : Hello
use: javac [-g] [-O] [-classpath path] [-d dir]
file.java...
sable.soc.staffs.edu.my> javac Hello.java
sable.soc.staffs.edu.my> java Hello
Hello !!
sable.soc.staffs.edu.my>
```

Figure 1: Interface Style 1

PAYMENT DETAILS	P3-7
Please select payment method:	
1. cash	
2. cheque	
3. credit card	
:	
9. abort transaction	

Figure 2: Interface Style 2

[4 marks]

- b) In interaction design, appearance of an interaction design can affect users' perception and emotion. Appearance or image informs user of something or translates a message completely into a thought. Anthropomorphism and zoomorphism are two types of appearance usually used in interaction design. Briefly, differentiate anthropomorphism and zoomorphism. Then draw 2 different images or appearances to represent anthropomorphism and zoomorphism [2 marks]
- c) What are the main components of Conceptual Model (CM) proposed by Johnson & Henderson? [2 marks]
- d) Why is lifecycle model important in the process of interaction design (ID)? Give ONE (1) example each of lifecycle model from Human Computer Interaction (HCI) and from software engineering. [2 marks]

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**QUESTION 2:**

- a) A stakeholder is defined as anyone who is affected by the success or failure of the system. There are FOUR (4) categories of stakeholder. List those categories of stakeholder and classify them with an example for an airline booking system. Assume an international airline is considering of introducing a new booking system to be used by associated travel agents to sell flights directly to the user. [4 marks]
- b) Evaluation should occur throughout the design process. If the design can be evaluated, expensive mistakes can be avoided, since the final design can be altered prior to any major resource commitments. Think aloud is considered as one possible approach to evaluating design. Give THREE (3) important characteristics of think aloud approach. [3 marks]
- c) Computer Mediated Communication (CMC) or Time/Space Matrix is one type of collaborative technologies that can support conversations. It contains synchronous/asynchronous interaction. Draw the Time/Space Matrix to represent this CMC technology. [3 marks]

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**SECTION C: CHOOSE ONLY ONE QUESTION (Total=10 marks)****QUESTION 3:**

- a) Figure 3 is an image of a Clippy for Microsoft users. Why was Clippy disliked by so many people? [2 marks]

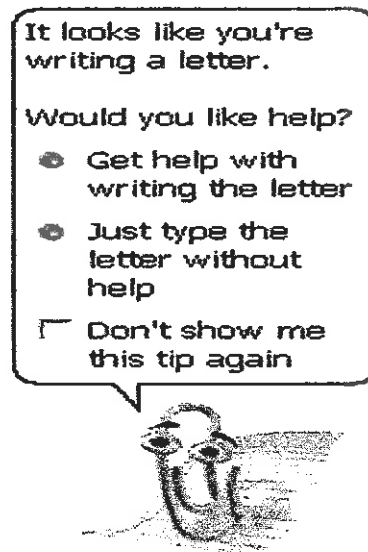


Figure 3: Clippy

- b) All prototypes involve compromises and intention to produce something quickly to test an aspect of the product. There are TWO (2) common types of compromises. Explain them. [2 marks]
- c) Differentiate storyboard prototype and card-based prototype. [2 marks]
- d) Give FOUR (4) characteristics of usability testing? [4 marks]

Continued...

**QUESTION 4:**

- a) What is Hawthorne effect? [1 mark]
- b) Jakob Nielsen's 10 general principles for interaction design are called "heuristics" because they are broad rules of thumb and not specific guidelines. List all 10 principles of Nielsen's Heuristics. [5 marks]
- c) Talking is effortless and naturally to most people. Various mechanisms and 'rules' are followed when holding a conversation. List 6 conversational rules. [3 marks]
- d) Collaborative technologies need a balance between human and system control. What happened if there is too much system control or too little system control? [1 mark]

**End of Paper**